

CLAIMS

1. A dielectric line comprising: a dielectric strip provided between two conductive plates approximately parallel to each other and having a width smaller than that  
5 of the conductive plates,

wherein the dielectric strip is composed of a porous material, and

the other parts between the two conductive plates other than the dielectric strip are filled with dielectric medium  
10 layers composed of a porous material having a dielectric constant smaller than that of the dielectric strip.

2. The dielectric line according to Claim 1, wherein the dielectric strip and the dielectric medium layers are composed of a substantially identical material and have  
15 different porosities from each other.

3. The dielectric line according to Claim 1, wherein the distance between the two conductive plates is one-half or less the wavelength of a signal in the dielectric medium layers, the signal being transmitted through the dielectric  
20 line.

4. The dielectric line according to Claim 1, wherein the dielectric strip and the dielectric medium layers are composed of an aerogel material.

5. A method for producing a dielectric line having a  
25 dielectric strip provided between two conductive plates

approximately parallel to each other and having a width smaller than that of the conductive plates, and dielectric medium layers filled between the conductive plates other than the dielectric strip and composed of a porous material  
5 having a dielectric constant smaller than that of the dielectric strip, the method comprising:

a film forming step of forming a film on one of the conductive plates using a dielectric raw material;

a strip exposure step of exposing a part of the film of  
10 the dielectric raw material to predetermined light, beams, or vapor, the part having a shape corresponding to the dielectric strip; and

a pore forming step of making the entire film of the dielectric raw material porous.

15 6. The method for producing a dielectric line, according to Claim 5,

wherein the strip exposure step is a step of exposing the part having a shape corresponding to the dielectric strip to ultraviolet rays, electron beams, X-rays, or ion  
20 beams, and

the dielectric raw material comprises a photosensitive material.

7. The method for producing a dielectric line, according to Claim 5,

25 wherein the strip exposure step is a step of exposing

the part having a shape corresponding to the dielectric strip to moisture vapor, vapor containing an acidic material, vapor containing a basic material, or vapor containing a dielectric raw material.

5       8. The method for producing a dielectric line, according to Claim 6, wherein the photosensitive material comprises a photo-acid generator.

9. The method for producing a dielectric line, according to Claim 5, wherein the dielectric raw material comprises an  
10       organic metal material.

10. The method for producing a dielectric line, according to Claim 9, wherein the organic metal material comprises a metal alkoxide.

11. The method for producing a dielectric line, according  
15       to Claim 5, wherein the dielectric raw material comprises a surfactant.

12. A method for producing a dielectric line having a dielectric strip provided between two conductive plates approximately parallel to each other and having a width  
20       smaller than that of the conductive plates, and dielectric medium layers filled between the conductive plates other than the dielectric strip and composed of a porous material having a dielectric constant smaller than that of the dielectric strip, the method comprising:

25       a first film forming step of forming a first film using

a first dielectric raw material on one of the conductive plates;

5 a film removing step of removing the first film except for a part having a shape corresponding to the dielectric strip;

a second film forming step of forming a second film using a second dielectric raw material on said one of the two conductive plates which is processed by the film removing step; and

10 a pore forming step of making porous the entire films of the first dielectric raw material and the second dielectric raw material.

13. The method for producing a dielectric line, according to Claim 12, wherein the film removing step comprises  
15 exposing the part of the first film of the first dielectric raw material to predetermined light or beams, the part having a shape corresponding to the dielectric strip, and then performing development treatment to remove the first film other than the part having a shape corresponding to the  
20 dielectric strip.

14. The method for producing a dielectric line, according to Claim 12, wherein the first dielectric raw material comprises a photosensitive material.

15. The method for producing a dielectric line, according to Claim 14, wherein the photosensitive material comprises a  
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photo-acid generator.

16. The method for producing a dielectric line, according to Claim 12, wherein the dielectric raw material comprises an organic metal material.

5 17. The method for producing a dielectric line, according to Claim 16, wherein the organic metal material comprises a metal alkoxide.

18. The method for producing a dielectric line, according to Claim 12, wherein the dielectric raw material comprises a  
10 surfactant.